

WHAT IS CLAIMED IS:

1. A polarized light reflecting element  
comprising:

at least one polymerized liquid crystal layer,  
cholesteric, chiral-nematic, or chiral, having a  
helical liquid crystal molecule array and a helical  
axis extending substantially in the normal direction,

the in-plane mean value  $\alpha$  of the respective helix  
angles of the liquid crystal molecules being given by

$$n\pi - 0.05\pi \leq \alpha \leq n\pi + 0.05\pi \quad (n = 1, 2, 3, \dots).$$

2. A polarized light reflecting element according  
to claim 1, wherein a plurality of said liquid crystal  
layers with different helix pitches are stacked so that  
the liquid crystal molecules are continuously oriented  
on the interfaces between the liquid crystal layers and  
that one smooth helical structure is formed as a whole.

3. A polarized light reflecting element according  
to claim 2, wherein the mean value  $\alpha$  of the respective  
helix angles of the liquid crystal molecules of each  
said liquid crystal layer is given by

$$n\pi - 0.05\pi \leq \alpha \leq n\pi + 0.05\pi \quad (n = 1, 2, 3, \dots).$$

4. A polarized light reflecting element according  
to claim 1, wherein each of said liquid crystal layers  
has a helical liquid crystal molecule array and a  
thickness such that the layer reflects some of specific  
circularly polarized light components of incident light  
and transmits the remainder of the specific circularly

polarized light components not reflected and almost all other light components other than the specific circularly polarized light components.

5           5. A polarized light reflecting element according to claim 4, wherein the ratio between the reflected and transmitted ones of the specific circularly polarized light components ranges from 5:5 to 9:1.

6. A half-transmission-type liquid crystal display element comprising:  
10           a first polarization plate;  
            a liquid crystal cell;  
            a second polarization plate; and  
            the polarized light reflecting element according to claim 1 located between the first and second  
15           polarization plates.

7. A half-transmission-type liquid crystal display element according to claim 6, wherein the first and second polarization plates have reverse circular polarization characteristics, and the polarized light  
20           reflecting element and the first and second polarization plates are located in a manner such that the transmittance of the polarized light reflecting element is at a minimum when the respective optical axes of the first and second polarization plates are  
25           rotated individually.

8. A liquid crystal display element comprising:  
            a first polarization plate;

a liquid crystal cell;

a second polarization plate;

a backlight source;

5 the polarized light reflecting element according  
to claim 1 located between the second polarization  
plate and the backlight source; and

a  $\lambda/4$ -wavelength plate located between the second  
polarization plate and the polarized light reflecting  
element.

10 9. A method of manufacturing a polarized light  
reflecting element, comprising:

forming an oriented film on a substrate;

orienting the oriented film so that liquid crystal  
molecules are controlled in one in-plane direction;

15 forming a liquid crystal layer having a helical  
structure on the oriented film; and

orienting and solidifying the liquid crystal  
molecules in the top portion of the liquid crystal  
layer in substantially the same direction as the  
20 direction of orientation of the oriented film.

10. A method of manufacturing a polarized light  
reflecting element, comprising:

forming an oriented film on a substrate;

25 orienting the oriented film so that liquid crystal  
molecules are controlled in one in-plane direction;

forming a first liquid crystal layer having a  
helical structure on the oriented film;

orienting and solidifying the top portion of the first liquid crystal layer in substantially the same direction as the direction of orientation of the oriented film;

5           forming a second liquid crystal layer having a helical structure on the first liquid crystal layer; and

          orienting and solidifying the top portion of the second liquid crystal layer in substantially the same direction as the direction of orientation of the oriented film.

11. A method of manufacturing a polarized light reflecting element, comprising:

          forming a first oriented film on a substrate;  
15           orienting the first oriented film so that liquid crystal molecules are controlled in one in-plane direction;

          forming a first liquid crystal layer having a helical structure on the first oriented film;  
20           orienting and solidifying the top portion of the first liquid crystal layer in substantially the same direction as the direction of orientation of the first oriented film;

          forming a second oriented film on the first liquid  
25 crystal layer;

          orienting the second oriented film in substantially the same direction as the direction of

orientation of the first oriented film;

forming a second liquid crystal layer on the  
second oriented film; and

orienting and solidifying the top portion of the  
5 second liquid crystal layer in substantially the same  
direction as the direction of orientation of the first  
oriented film.

12. A method of manufacturing a polarized light  
reflecting element according to claim 11, wherein the  
10 first and second oriented films and the second liquid  
crystal layer are formed so that the respective  
refractive indexes thereof account for 95% to 1005% of  
the refractive index of the first liquid crystal layer.